



# Transportation Analysis under CEQA

## First Edition\*

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### Evaluating Transportation Impacts of State Highway System Projects

California Department of Transportation  
Sacramento, California  
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*\*Important updates to the First Edition are posted to the "Bulletins and Hot Topics" section of the Caltrans SB 743 website at <https://dot.ca.gov/programs/sustainability/sb-743>.*

## **ACKNOWLEDGEMENTS**

The *Transportation Analysis Framework (TAF)* and *Transportation Analysis Under CEQA (TAC)* were prepared by the California Department of Transportation working with State Administration partners and Stakeholders from the public, private and non-profit sectors. Contributors within the Department included staff and management from the Headquarters Divisions of Environmental Analysis, Transportation Planning, Traffic Operations, and Legal, as well as from the Director's Office Sustainability Team. The Headquarters team benefitted from input provided by the Caltrans Executive Team as well as by staff and management from Caltrans districts.

The documents are the products of a collaboration among State government partners. Throughout the development of the documents, the Caltrans team worked closely with technical and policy experts from the Governor's Office of Policy and Research and the California Air Resources Board.

A list of the individuals who contributed to the preparation of the TAF and TAC is included at the end of this document. We are grateful for the time and effort that they generously gave to develop and document the Department's new approach to analyzing and evaluating transportation impacts of projects on the State Highway System.

## LETTER FROM THE DIRECTOR

To Caltrans staff, partners, and stakeholders,



I am pleased to issue the enclosed guidance document: *Transportation Analysis under the California Environmental Quality Act (CEQA) for Projects on the State Highway System (TAC)* as part of the California Department of Transportation's (Caltrans) continuing commitment to implement the California Environmental Quality Act in alignment with State goals and policies. The TAC, and its companion document, *Transportation Analysis Framework (TAF)*, provides Caltrans policy along with guidance for implementing Senate Bill (SB) 743 (Steinberg, 2013) codified at Public Resources Code section 21099.

The new processes implemented through Caltrans' environmental program are a key part of Caltrans' increasingly important work to confront the challenge of climate change and build more livable communities. Caltrans is actively implementing strategies to reduce emission of greenhouse gases, including initiatives to use clean fuels and vehicles, and to reduce waste. Perhaps most importantly, we are rethinking the way we invest so people can drive less.

Reducing total driving, or vehicle miles traveled, is the focus of the TAC, TAF and the associated changes to transportation impact analysis under CEQA for projects on the State Highway System. In plain terms, the more we drive our cars, the more damage we cause to the environment and our health—and the less time we spend with our families and communities. A vehicle miles traveled-based approach supports transportation projects that create more travel choices, such as new rail lines, improved bus service, trails, paths, and safer streets for walking and bicycling. As these modes of transportation grow, we can reduce the dependence and burden on our already congested highway system.

Thank you to our partners and stakeholders, as well as to Caltrans staff, whose contributions have helped to shape this document. I look forward to your continued partnership as we make the changes needed to meet California's goals for climate, air quality, and public health. It's an exciting time to continue our commitment to provide more transportation options to Californians and reduce our dependence on driving.

Sincerely,

A handwritten signature in black ink, appearing to read 'T. Omishakin'. The signature is fluid and cursive, written in a professional style.

Toks Omishakin  
Director, Caltrans

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## FOREWORD

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The *Transportation Analysis Framework* (TAF) and *Transportation Analysis under CEQA* (TAC) guide transportation impact analysis for projects on the State Highway System (SHS) as part of the California Environmental Quality Act (CEQA) process. The California Department of Transportation (Caltrans) has prepared these documents to guide implementation of Senate Bill (SB) 743 (Steinberg, 2013). The TAF and TAC establish Caltrans guidance on how to analyze induced travel associated with transportation projects and how to determine impact significance under CEQA, respectively. These documents guide transportation impact analysis for projects on the SHS only. The non-capacity-increasing maintenance projects like re-paving and filling potholes are unaffected, as are many safety improvements, including traffic calming measures to slow traffic, and transportation projects that create facilities for pedestrians and cyclists and transit projects.

In response to a high level of interest in the guidance from Caltrans' transportation partners, climate and environmental advocates and others, Caltrans has hosted a total of 130 meetings with stakeholders and provided a 60-day informal feedback period on the draft documents. Statewide outreach events included two external webinars attended by over 850 participants and three external technical roundtables attended by more than 150 participants. These Caltrans events were supplemented by OPR's webinar and Office Hours outreach which reached over 3,500 participants. Additionally, Caltrans met regularly through the guidance development process with key stakeholders including the Self-help Counties Coalition, the ClimatePlan coalition, and the Rural Counties Task Force.

Caltrans received feedback on the drafts from 37 agencies including counties, cities, and MPOs as well as from consultants, advocates, coalitions and other State agencies. Throughout the process, a small number of controversial issues stood out. To address the difference of opinions around key technical issues, Caltrans convened an expert panel of academics and practitioners through UC Berkeley Tech Transfer. The panel chair presented the group's conclusions to stakeholders at a virtual Technical Roundtable prior to finalizing the group's recommendations. Caltrans and State partners have accepted the panel's recommendations, which are reflected in the guidance documents.

The Caltrans TAF and TAC guidance documents reflect a cultural shift in how Caltrans interprets, analyzes and mitigates transportation impacts. This shift will impact the entire project delivery process and shape the future of California's transportation system. The September 2020 TAF and TAC are the first versions of these materials, and we anticipate future improvement as our understanding and expertise deepens through implementation. Your continuing input and partnership with Caltrans will help further improve the guidance. Your commitment and participation in this ongoing work is appreciated.

# 1 INTRODUCTION/BACKGROUND

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The intent of this guidance is to provide information to support Caltrans' CEQA practitioners in making CEQA significance determinations for transportation impacts of projects on the SHS.

With the passage of Senate Bill (SB) 743 (Steinberg, 2013) codified at Public Resources Code (PRC) section 21099, California embarked on a new approach for analyzing transportation impacts under CEQA. These changes require updates to both the Caltrans Local Development-Intergovernmental Review (LD-IGR) function and project delivery for projects on the SHS.

In SB 743, the California State Legislature (Legislature) found and declared the following:

- (1) With the adoption of Chapter 728 of the Statutes of 2008, popularly known as the Sustainable Communities and Climate Protection Act of 2008, the Legislature signaled its commitment to encouraging land use and transportation planning decisions and investments that reduce vehicle miles traveled and contribute to the reductions in greenhouse gas emissions required in the California Global Warming Solutions Act of 2006 (Division 25.5 (commencing with Section 38500) of the Health and Safety Code). Similarly, the California Complete Streets Act of 2008 (Chapter 657 of the Statutes of 2008) requires local governments to plan for a balanced, multimodal transportation network that meets the needs of all users of streets, roads, and highways for safe and convenient travel.*
- (2) Transportation analyses under the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) typically study changes in automobile delay. New methodologies under the California Environmental Quality Act are needed for evaluating transportation impacts that are better able to promote the state's goals of reducing greenhouse gas emissions and traffic-related air pollution, promoting the development of a multimodal transportation system, and providing clean, efficient access to destinations.*

The legislative intent of SB 743 is to do both of the following:

- 1) Ensure that the environmental impacts of traffic, such as noise, air pollution, and safety concerns, continue to be properly addressed and mitigated through the CEQA.
- 2) More appropriately balance the needs of congestion management with statewide goals related to infill development, promotion of public health through active transportation, and reduction of greenhouse gas (GHG) emissions.



In December 2018, the Office of Administrative Law approved updates to the formal CEQA regulations prepared by OPR. The formal regulations are generally referred to as the CEQA “Guidelines.” The update contained, among other things, a new section 15064.3 addressing transportation impacts. OPR also released [the \*Technical Advisory on Evaluating Transportation Impacts in CEQA\*](#) which contains recommendations on assessing vehicle miles traveled (VMT), significance, and mitigation measures.<sup>1</sup>

Section 15064.3 of the Guidelines separately addresses the analysis of transportation impacts arising from land use projects and those arising from transportation projects. For Caltrans, SB 743 means major changes in two activities:

- 1) Review of a proposed land use project's or a proposed plan's potential impact to the SHS, which are generally addressed through the Caltrans Local Development-Intergovernmental Review Program.
- 2) CEQA analysis of capacity-increasing transportation projects on the SHS.

These changes are consistent with both the CEQA Guidelines and OPR's Technical Advisory. Together, they aim to reduce automobile use while increasing use of more sustainable modes of transportation that are essential to supporting our growing population and economy, while also meeting climate goals. Reducing VMT corresponds with the goals detailed in Caltrans' Strategic Management Plan. It is also consistent with and will aid Caltrans in continuing to meet its policy aims for the Environment (Director's Policy [DP-004]); Freeway System Management (DP-08); Energy Efficiency, Conservation, and Climate Change (DP-023-R1); Climate Change (DP-30); and Sustainability (DP-033), among others.

This guidance establishes Caltrans' process for analyzing a transportation project's impacts under CEQA due to increases in VMT attributable to that project and offers an initial list of potential mitigation measures for significant impacts. This guidance augments but does not change any of the basic processes currently in place for evaluating projects under CEQA and other applicable laws or regulations. This guidance is not intended to address transportation impacts resulting from land-use projects which are addressed in the separate *Transportation Impact Study Guide* (TISG). Nor is this guidance intended to provide detailed instruction on performing the induced travel analysis itself, which can instead be found in the *Transportation Analysis Framework* (TAF).

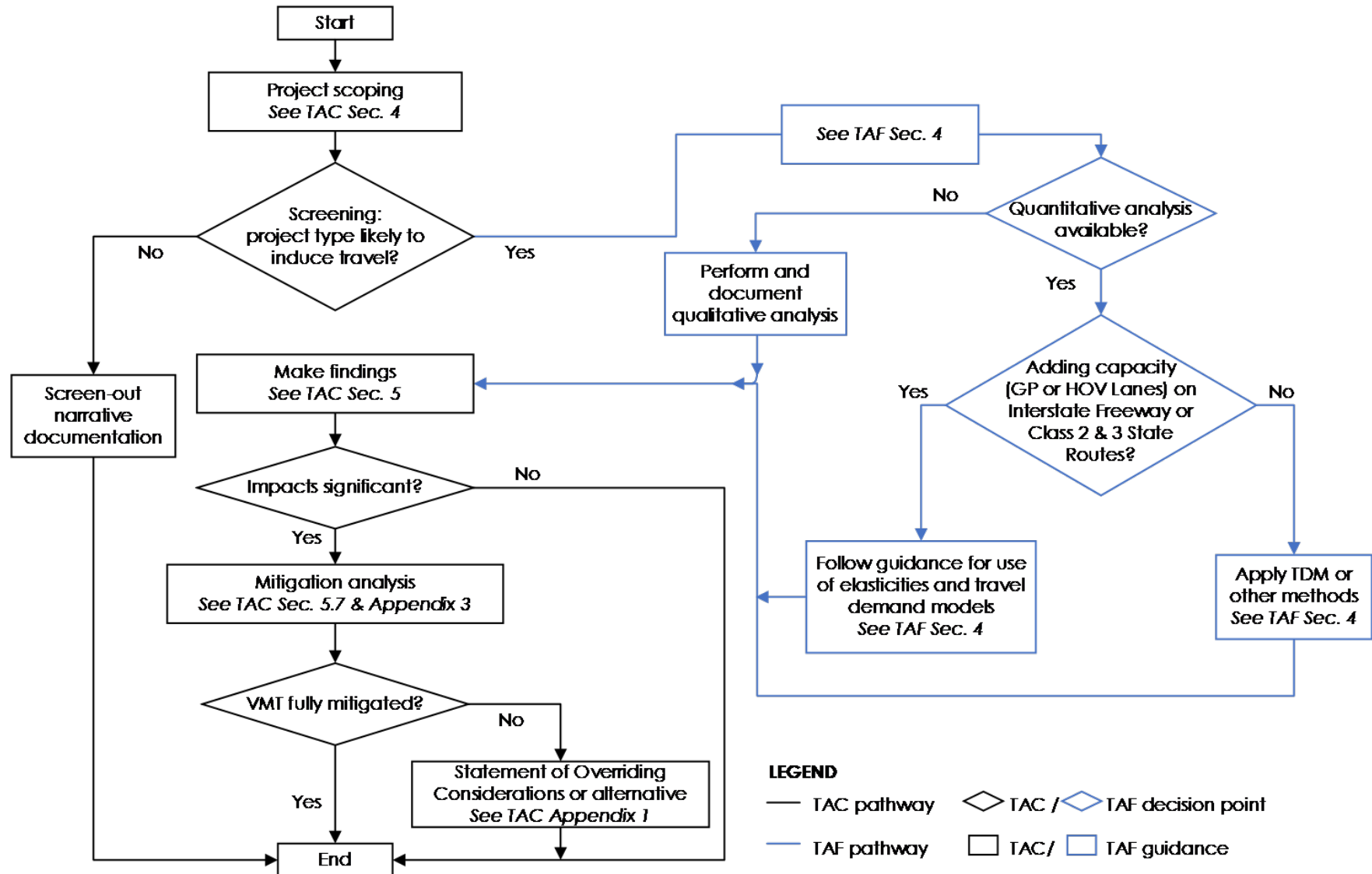
The TAC is to be used in conjunction with the guidance provided in the TAF. The flow chart provided as Figure 1 illustrates the relationship between the TAC and TAF.

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<sup>1</sup> Office of Planning and Research, *Technical Advisory on Evaluating Transportation Impacts in CEQA* (December 2018).

**TRANSPORTATION ANALYSIS UNDER CEQA (TAC)**

**TRANSPORTATION ANALYSIS FRAMEWORK (TAF)**



**Figure 1. Relationship Between the TAC and TAF Documents**

## 2 REGULATORY SETTING

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This section contains a listing of relevant laws, regulations, documents, and references for project-level VMT analysis.

*Regional VMT analysis* takes place during the development of the Regional Transportation Plans (RTPs), which are prepared and adopted every five years by the 26 rural Regional Transportation Planning Agencies (RTPAs), and every four years for the 18 Metropolitan Planning Organizations (MPOs) located in air quality non-attainment areas and at least every five years for MPOs located in air quality attainment areas. An RTP is a long-range, fiscally constrained plan prepared subject to federal and State requirements. It provides a vision for regional transportation investments over a period of 20 years or more and analyzes the transportation system and its relationships to a region's economy, environment, livability, and more.

### 2.1 SUSTAINABLE COMMUNITIES AND CLIMATE PROTECTION ACT OF 2008

Senate Bill 375 (Steinberg), known as the Sustainable Communities and Climate Protection Act, was enacted in 2008. SB 375 directed the California Air Resources Board (CARB) to adopt regional GHG emissions reduction targets applicable to each MPO region. SB 375 also required the State's 18 MPOs to: 1) prepare a sustainable communities strategy (SCS) to achieve the GHG-reduction target as part of the RTP; or 2) prepare an "alternative planning strategy" if the SCS does not achieve the reductions called for by the regional targets.

Senate Bill 375 also required the California Transportation Commission, in conjunction with CARB, to maintain guidelines for the travel demand models used in the development of RTPs.

Each RTPA or MPO must also complete an environmental analysis of its RTP pursuant to CEQA. These environmental documents analyze the anticipated environmental effects arising from the implementation of the region's RTP, including transportation impacts. The environmental documents prepared by the RTPAs and MPOs report a variety of VMT-related metrics or performance measures in their analyses including total annual VMT, per capita VMT, and congested VMT.

## 2.2 CEQA GUIDELINES

Section 15064.3 of the CEQA Guidelines (Guidelines) addresses *Project-level VMT analysis* under CEQA.

The portion of the Guidelines that address transportation projects (rather than land use projects), begins at section 15064.3(b) and reads:

*(2) Transportation Projects. Transportation projects that reduce, or have no impact on, vehicle miles traveled should be presumed to cause a less than significant transportation impact. For roadway capacity projects, agencies have discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements. To the extent that such impacts have already been adequately addressed at a programmatic level, such as in a regional transportation plan EIR, a lead agency may tier from that analysis as provided in Section 15152.*

*(3) Qualitative Analysis. If existing models or methods are not available to estimate the vehicle miles traveled for the particular project being considered, a lead agency may analyze the project's vehicle miles traveled qualitatively. Such a qualitative analysis would evaluate factors such as the availability of transit, proximity to other destinations, etc. For many projects, a qualitative analysis of construction traffic may be appropriate.*

*(4) Methodology. A lead agency has discretion to choose the most appropriate methodology to evaluate a project's vehicle miles traveled, including whether to express the change in absolute terms, per capita, per household or in any other measure. A lead agency may use models to estimate a project's vehicle miles traveled, and may revise those estimates to reflect professional judgment based on substantial evidence. Any assumptions used to estimate vehicle miles traveled and any revisions to model outputs should be documented and explained in the environmental document prepared for the project. The standard of adequacy in Section 15151 shall apply to the analysis described in this section.*

Several broader observations about section 15064.3 and how it relates to this guidance are important to note:

- Per section 15064.3, VMT is “Generally the most appropriate measure of transportation impacts.” The simplest definition of VMT, or vehicle mile traveled, is “One vehicle traveling on a roadway for one mile” (Sacramento Area Council of Governments 2016 MTP/SCS). Section 15064.3(a) defines “vehicle miles traveled” as “The amount and distance of automobile travel attributable to a project.” This is a significant change from previous

methodologies which typically analyzed Level of Service (LOS)<sup>2</sup>, a travel time and congestion metric, as the most important consideration in transportation impacts analysis. When evaluating transportation impacts on the SHS, Caltrans will now evaluate the “induced travel,” or the change in VMT attributable to an individual transportation project.

- Certain project types, primarily those which are non-capacity increasing, are presumed to result in a less than significant transportation impact and therefore generally do not require analysis of vehicle miles traveled. Those project types are discussed in section 5.1 of this document and are also described in the OPR Technical Advisory.
- A lead agency may in some cases tier its transportation impact analysis, as appropriate, from the environmental impact reports (EIRs) prepared for regional transportation plans/sustainable community strategies (RTP/SCS).<sup>3</sup> See the discussion in section 5.1.2. of this document to assess whether transportation impacts have been adequately analyzed at the programmatic level, and whether tiering from an RTP/SCS EIR or other analysis may be appropriate.
- Quantitative analysis is most appropriate for transportation projects which increase roadway capacity. Please refer to Section 4 of the TAF for further discussion.
- Qualitative analysis may be appropriate for certain transportation projects, particularly when technical models are not available, as discussed in TAF Section 4. The use of a qualitative analysis should generally be limited to those situations in which quantitative tools are unable to adequately assess a transportation project’s impacts. Please refer to Section 4 of the *Transportation Analysis Framework: Induced Travel Analysis (TAF)* for more details.

Caltrans has chosen to express change in VMT in absolute terms.

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<sup>2</sup> The Highway Capacity Manual, which first introduced the concept of LOS in 1965, defines LOS as follows: “Level of service (LOS) is a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. Safety is not included in the measures that establish service levels.” Additionally, “each facility type that has a defined method for assessing capacity and level of service also has performance measures that can be calculated. These measures reflect the operating conditions of a facility, given a set of roadway, traffic, and control conditions. Travel speed and density on freeways, delay at signalized intersections, and walking speed for pedestrians are examples of performance measures that characterize flow conditions on a facility” (Highway Capacity Manual, 2000).

<sup>3</sup> It should be noted that some RTPs/SCSs are not consistent with the state’s climate goals, according to CARB. See CARB, “CARB 2017 Scoping Plan,” 4. A close review of the applicable EIR for the RTP will be required in order to “tier” from its analysis.

## **3 OTHER RELEVANT DOCUMENTS AND REFERENCES**

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### **3.1 TECHNICAL ADVISORY ON EVALUATING TRANSPORTATION IMPACTS IN CEQA (OPR TECHNICAL ADVISORY)**

The OPR Technical Advisory provides recommendations on assessing VMT, significance, and mitigation measures. Practitioners should consult the OPR Technical Advisory when evaluating transportation impacts of projects on the SHS.

### **3.2 CALIFORNIA AIR RESOURCES BOARD CLIMATE CHANGE SCOPING PLAN**

In 2006, the Legislature passed Assembly Bill 32 (AB 32, Nunez), known as the California Global Warming Solutions Act of 2006, which created a comprehensive, multi-year program to reduce GHG emissions in California. AB 32 required CARB to develop the Scoping Plan to describe the approach California would take to reduce GHGs to meet the target of reducing emissions to 1990 levels by 2020. The Scoping Plan was first approved by CARB in 2008 and updated in 2014 and again in 2017.<sup>4</sup>

In 2016, the Legislature passed SB 32 (Pavley), which codified a statewide 2030 GHG emissions-reduction target of 40 percent below 1990 levels. Along with SB 32, the Legislature passed companion legislation, AB 197 (Eduardo Garcia), which provided additional direction for updating the Scoping Plan. These changes were reflected in the second update to the Scoping Plan completed in 2017.

### **3.3 CALIFORNIA AIR RESOURCES BOARD'S MOBILE SOURCE STRATEGY**

In May 2016, CARB released the updated Mobile Source Strategy which demonstrates how the State can simultaneously meet air quality standards, achieve GHG emissions reduction targets, decrease health risk, and reduce petroleum consumption from the transportation sector through a modeling scenario—the “Cleaner Technologies and Fuels Scenario” (CTF). Although the majority of GHG reductions in the scenario are assumed to be attributable to new vehicle technologies and low carbon fuels, the CTF also demonstrates the need for a 15 percent reduction in total light-duty VMT by 2050 as compared to baseline 2050 levels. This scenario would require light-duty VMT growth of only five percent by 2030, compared to the current growth trajectory of approximately 11 percent.<sup>5</sup> The combined strategies within the CTF scenario, including VMT reduction, would achieve a 45 percent reduction in on-road GHG emissions by 2030, and an

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<sup>4</sup> California Air Resources Board, “2017 Scoping Plan Documents.” Available at <https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2017-scoping-plan-documents>.

<sup>5</sup> California Air Resources Board, “Mobile Source Strategy,” (May 2016), 37.

approximately fifty percent reduction in on-road petroleum demand by 2050, meeting both climate targets. CARB continues to implement the 2016 Mobile Source Strategy and in 2020 is in the process of updating the Strategy, as required by Senate Bill 44 (Skinner).<sup>6</sup>

### **3.4 CALIFORNIA AIR RESOURCES BOARD'S SUSTAINABLE COMMUNITIES AND CLIMATE PROTECTION ACT PROGRESS REPORT**

In November of 2018, CARB published the "2018 Progress Report: California's Sustainable Communities and Climate Protection Act" (Progress Report). The Progress Report indicates California is not on track to meet the GHG reductions expected under SB 375. According to the Progress Report, actual statewide per capita VMT had not declined as expected under SB 375 but at the time the report was written, was increasing. The fundamental finding in CARB's Progress Report is that California is not on track to meet GHG emissions reductions expected under SB 375 and will not meet SB 32 GHG emissions targets without significant changes to how communities and transportation systems are planned, funded, and built.<sup>7</sup>

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<sup>6</sup> California Air Resources Board, "2020 Mobile Source Strategy." Available at <https://ww2.arb.ca.gov/resources/documents/2020-mobile-source-strategy>.

<sup>7</sup> California Air Resources Board, "2018 Progress Report: Sustainable Communities and Climate Protection Act". (November 2018), 3, 5.

## 4 PROJECT SCOPING

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Formal scoping will continue to follow established procedures identified under CEQA, including preparation of a Notice of Preparation for an EIR. Scoping a project on the SHS is a collaborative process.

Preliminary environmental scoping occurs even earlier, during the “Project Initiation Phase” and this phase culminates in the “programming” of transportation projects. Transportation programming is the commitment of transportation funds to particular projects, to be available over a period of several years. Separate programming documents, prepared and adopted for somewhat different purposes, are required under both federal and State law.

Deviating from the programmed scope, schedule or budget is an uncertain process, and represents a potential risk to a project’s successful delivery. Projects that do not have an accurate scope may face cost increases and schedule delays. Because of fiscal and schedule constraints, it may become increasingly difficult to achieve feasible and proportional project-level VMT mitigation as a roadway capacity-increasing project proceeds from initial scoping to final design. Therefore, it is important to thoroughly consider a range of feasible project alternatives and/or mitigation which meet the purpose and need of the project, as well as feasible mitigation which can potentially minimize, or avoid altogether, the additional VMT from capacity-increasing projects.

The following options, and others which may avoid VMT impacts, require close coordination with federal, state, and regional transportation partners, and should be considered as early as possible in the planning process, as part of the range of VMT-reducing alternatives to capacity-increasing projects.

- Invest in multimodal transportation infrastructure: Caltrans and/or partnering agencies could directly invest in infrastructure likely to support VMT reduction in order to mitigate the impacts of capacity increasing projects.
- Expand toll lane use or develop other pricing-based strategy options: This option would consist of expanding the use of toll lanes or developing other pricing strategies, such as increasing parking prices in an area, to reduce VMT.

Other potential options to reduce project-level VMT impacts are discussed in the mitigation section of this document (section 5.7).

In addition to mitigation, another consideration during the preliminary scoping of project involves the determination of the appropriate level of environmental document. For new projects, Project Development Teams (PDTs) should consider the likelihood of a potentially significant environmental impact (applying the methods in Section 5) when determining the appropriate level of document. PDTs should also evaluate whether projects initially determined to require a Negative Declaration/Mitigated Negative Declaration (ND/MND) may instead require an EIR if there is a potential for a significant impact, and, if no feasible alternative or



mitigation substantially reduces that impact, a Statement of Overriding Considerations may be appropriate.

## 5 THE CEQA ANALYSIS

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This guidance document is primarily intended to address the following question on the CEQA checklist found in Guidelines Appendix G, section XVII(b):

***Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?***

The portion of section 15064.3(b) of the CEQA Guidelines pertaining to transportation projects provides that for roadway capacity projects “...agencies have the discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements.” Consistent with the language of Section 15064.3 of the CEQA Guidelines, Caltrans concurs that VMT is the most appropriate measure of transportation impacts under CEQA. The determination of significance of a VMT impact will require a supporting induced travel analysis for capacity-increasing transportation projects on the SHS when Caltrans is lead agency or when another entity acts as the lead agency.

Whether a project is in conflict or inconsistent with CEQA Guidelines section 15064.3(b) will be evaluated by practitioners based on its potential to increase VMT attributable to the project, (i.e., induced travel), as discussed in the Section 5.6 below. The guidance in this document further explains the types of projects and impacts that would be considered significant within this context.

The remaining CEQA checklist questions generally associated with transportation impacts are listed in Appendix G of the CEQA Guidelines and are addressed in Appendix B of this document. Each question should be analyzed independently. If other potential impacts are identified for a particular project, the standard CEQA analytical process would apply and significance determinations made for each, as appropriate.

### 5.1 SCREENING

The use of VMT as the CEQA transportation metric will, in many cases, lead to a determination that roadway capacity-increasing projects result in significant transportation impacts. For many other types of transportation projects, however, a VMT impact analysis beyond the screening process is not necessary. Generally, there are two reasons such an analysis may not be warranted. The first is because the type of project would not be likely to lead to a measurable and substantial increase in VMT. The second is because the project’s VMT impacts have already been analyzed and, when necessary, mitigated to the extent feasible in an earlier CEQA document. In the latter case the analysis may “tier” from or otherwise rely on that earlier analysis.

### 5.1.1 SCREENING BY PROJECT TYPE: NON-CAPACITY-INCREASING VS. CAPACITY-INCREASING PROJECTS

Understanding the purpose and scope of the proposed project will assist the practitioner in determining which project types have the potential for a significant transportation impact. Determination of the project type usually occurs early in the project development process and is supported by the “purpose and need” of the project. A key consideration for the practitioner which is addressed below is determining whether a project type has the potential to induce travel.

If a project increases capacity, it will generally require an analysis to determine if there will be a significant transportation impact caused the increase in VMT attributable to the project. Many projects Caltrans regularly undertakes such as maintenance projects including culvert repairs, overlays, and restriping, do not increase capacity. During the screening review, practitioners should examine the specific project circumstances to ensure that there are no unusual circumstances which could otherwise lead to an increase in VMT. Then, practitioners should provide a brief discussion in the environmental document that describes why the project is not expected to increase VMT.

Taken directly from OPR’s Technical Advisory, the following excerpt describes types of projects likely to lead to measurable and substantial increases in VMT:

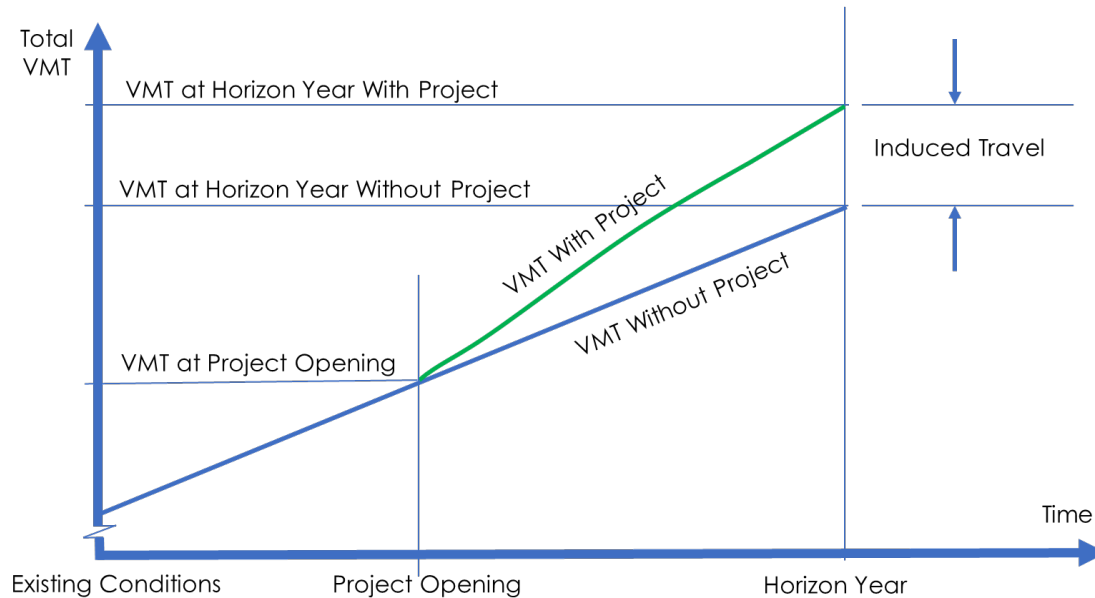
**i) *Project Types Likely to Lead to a Measurable and Substantial Increase in Vehicle Travel*<sup>8</sup>**

*Addition of through lanes on existing or new highways, including general purpose lanes, HOV lanes, peak period lanes, auxiliary lanes, or lanes through grade-separated interchanges, and other projects adding capacity to the State Highway System.*

These are project types that include the construction of new facilities or expansion of existing ones. These are common types of capacity-increasing projects that Caltrans constructs. These projects are likely to lead to a measurable and substantial increase in VMT. Therefore, an induced travel analysis is required to determine how much of the increase in VMT is attributable to the project (versus other variables such as the economy and population growth), and where impacts are significant, whether mitigation can reduce the impacts to a less than significant impact. Only the VMT that is directly attributable to the project should be analyzed (See TAC Figure 2). The TAF provides guidance for analyzing induced travel.

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<sup>8</sup> Office of Planning and Research, *Technical Advisory on Evaluating Impacts in Transportation* (OPR December 2018), 20.



**Figure 2. Identification of Induced Travel  
(VMT Attributable to a Transportation Project)**

The emphasis of this guidance is to identify those projects that will lead to a measurable and substantial increase in vehicle travel. The following describes projects not likely to lead to a measurable and substantial increase in VMT and which therefore generally should not require an induced travel analysis per OPR's Technical Advisory. The final six bullets on the list of project types not likely to lead to a measurable and substantial increase, beginning with "HOV bypass lanes on on-ramps" were added based on discussion with OPR. These are expected to be added to OPR's list of project types in a future update of the Technical Advisory. Note the deletion of the category of project described as "Addition of tolled lanes, where tolls are sufficient to mitigate VMT increase," which was also an outcome of discussion between Caltrans and OPR during the course of producing the TAC and TAF.

**ii) Project Types Not Likely to Lead to a Measurable and Substantial Increase in Vehicle Travel<sup>9</sup>**

- *Rehabilitation, maintenance, replacement, safety, and repair projects designed to improve the condition of existing transportation assets (e.g., highways; roadways; bridges; culverts; Transportation Management System field elements such as cameras, message signs, detection, or signals; tunnels; transit systems; and assets that serve bicycle and pedestrian facilities) and that do not add additional motor vehicle capacity*

<sup>9</sup> OPR, *Technical Advisory on Evaluating Transportation Impacts in CEQA* (December 2018), 20-21.

- *Roadside safety devices or hardware installation such as median barriers and guardrails*
- *Roadway shoulder enhancements to provide “breakdown space,” dedicated space for use only by transit vehicles, to provide bicycle access, or to otherwise improve safety, but which will not be used as automobile vehicle travel lanes*
- *Addition of an auxiliary lane of less than one mile in length designed to improve roadway safety*
- *Installation, removal, or reconfiguration of traffic lanes that are not for through traffic, such as left, right, and U-turn pockets, two-way left turn lanes, emergency truck pullovers, or emergency breakdown lanes that are not utilized as through lanes*
- *Addition of roadway capacity on local or collector streets provided the project also substantially improves conditions for pedestrians, cyclists, and, if applicable, transit*
- *Conversion of existing general-purpose lanes (including ramps) to managed lanes or transit lanes, or changing lane management in a manner that would not substantially increase vehicle travel*
- *Addition of a new lane that is permanently restricted to use only by transit vehicles*
- *Reduction in number of through lanes*
- *Grade separation to separate vehicles from rail, transit, pedestrians or bicycles, or to replace a lane in order to separate preferential vehicles (e.g., HOV, HOT, or trucks) from general vehicles*
- *Installation, removal, or reconfiguration of traffic control devices, including Transit Signal Priority (TSP) features*
- *Installation of traffic metering systems, detection systems, cameras, changeable message signs and other electronics designed to optimize vehicle, bicycle, or pedestrian flow*
- *Timing of signals to optimize vehicle, bicycle, or pedestrian flow*
- *Installation of roundabouts or traffic circles*
- *Installation or reconfiguration of traffic calming devices*
- *Adoption of or increase in tolls*
- *Initiation of new transit service*
- *Conversion of streets from one-way to two-way operation with no net increase in number of general purpose or continuous through traffic lanes*
- *Removal or relocation of off-street or on-street parking spaces*
- *Adoption or modification of on-street parking or loading restrictions (including meters, time limits, accessible spaces, and preferential/reserved parking permit programs)*
- *Addition of traffic wayfinding signage*
- *Rehabilitation and maintenance projects that do not add motor vehicle capacity*
- *Addition of new or enhanced bike or pedestrian facilities on existing streets/highways or within existing public rights-of-way*

- *Addition of Class I bike paths, trails, multi-use paths, or other off-road facilities that serve non-motorized travel*
- *Installation of publicly available alternative fuel/charging infrastructure*
- *Addition of passing lanes, truck climbing lanes, or truck brake-check lanes in rural areas that do not increase overall vehicle capacity along the corridor*
- *HOV bypass lanes on on-ramps*
- *Local and collector roads in rural areas that don't include sidewalks where there would be no pedestrian traffic to use them*
- *Lanes through grade-separated interchanges without additional receiving lanes downstream*
- *Adding vehicle storage to a ramp without further reconfiguration*
- *Park and Ride facilities*
- *Truck size and weight inspection stations*

While the above list is thorough, it is not necessarily comprehensive. There may be types of projects in addition to those listed that would not lead to a measurable and substantial increase in VMT. When concluding that a particular project may be screened out from further analysis, the practitioner should review and fully document the rationale supporting the conclusion that the particular project would not likely lead to a measurable and substantial increase in VMT.

### **5.1.2 TIERING**

As outlined in PRC sections 21068.5, 21093 and 21094, as well as Guidelines sections 15152 and 15385, tiering is a means of reducing redundancy, focusing analysis and ensuring consistency with earlier CEQA analyses. As defined in the PRC, tiering "...refers to using the analysis of general matters contained in a broader EIR (such as one prepared for a general plan or policy statement) with later EIRs and negative declarations on narrower projects; incorporating by reference the general discussions from the broader EIR; and concentrating the later EIR or negative declaration solely on the issues specific to the later project."

Tiering the project-level analysis from the regional analysis completed for the RTP/SCS EIR, or another EIR such as one prepared for a general plan or specific plan, would be the ideal method of determining the significance of transportation impacts. This is particularly true for an EIR prepared for an RTP/SCS, because if the regional modeling performed for a particular suite of projects (those that increase VMT and those that reduce VMT) has already accounted to some extent for the individual project's contributions, then the effects of the proposed project ideally would have already been mitigated entirely or in part. Although current RTP/SCS EIRs have limited utility for tiering transportation impact analysis, over time, tiering may become more available. Considerations to ensure that transportation impacts have been adequately evaluated and mitigated at the programmatic level include:

- The EIR must adequately evaluate the phenomenon of induced travel. The modeling performed for the suite of transportation projects and initiatives in a region must accurately capture the induced VMT from land use effects of those projects.
- If tiering from an RTP/SCS EIR, the EIR must demonstrate consistency with the State's GHG reduction targets because meeting the current SB 375 targets alone is not enough to demonstrate broad consistency between the RTP/SCS's VMT analysis and state climate goals. A transportation project which substantially increases VMT may conflict with State climate goals, even if the project was included in an RTP/SCS that meets the applicable GHG reduction targets called for by SB 375<sup>10</sup>. This is because the current RTPs/SCSs are anticipated to achieve an 18 percent reduction in statewide per capita, on-road light-duty, transportation-related GHG emissions relative to 2005 by 2035, if those RTP/SCSs are fully implemented. However, the State forecasts a 25 percent reduction is needed to meet the State's climate goals<sup>11</sup>.
- All feasible mitigation measures normally considered at the project level must be fully considered and properly applied at the plan level.

Note that even when tiering is not available, the CEQA Guidelines allow for the "incorporation by reference" of materials from a broader EIR. For example, the "environmental setting" for a project could be incorporated by reference from a broader EIR, thus streamlining the project-level analysis. Please see Guidelines §15150 for more information and the requirements for incorporation by reference.

## 5.2 BASELINE DETERMINATION

CEQA requires the comparison of impacts caused by a project to a "baseline" to determine whether those impacts are significant (Guidelines §15125).

Normally, future conditions with the project are compared to a baseline of "existing conditions." However, alternatives to an existing conditions baseline may be appropriate in certain circumstances, as included in the recent CEQA Guidelines update that reflects case law on determining the baseline to use in CEQA documents:

*Generally, the lead agency should describe physical environmental conditions as they exist at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced, from both a local and regional perspective. Where existing conditions change or fluctuate over time, and where necessary to provide the most accurate picture practically possible of the project's impacts, a lead*

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<sup>10</sup> California Air Resources Board, "CARB 2017 Scoping Plan-identified VMT Reductions and Relationship to State Climate Goals," (January 2019), 4.

<sup>11</sup> California Air Resources Board, "CARB 2017 Scoping Plan-identified VMT Reductions and Relationship to State Climate Goals," (January 2019), 3.

*agency may define existing conditions by referencing historic conditions, or conditions expected when the project becomes operational, or both, that are supported with substantial evidence. In addition, a lead agency may also use baselines consisting of both existing conditions and projected future conditions that are supported by reliable projections based on substantial evidence in the record (Guidelines § 15125(a)(1)).*

*A lead agency may also use projected future conditions (beyond the date of project operations) baseline as the sole baseline for analysis only if it demonstrates with substantial evidence that use of existing conditions would be either misleading or without informative value to decision-makers and the public. Use of projected future conditions as the only baseline must be supported by reliable projections based on substantial evidence in the record (Guidelines § 15125(a)(2)).*

Transportation projects are typically built years after the CEQA analysis is completed, and comparing to existing conditions would combine the project's VMT effects with other effects on VMT that occur over time, such as increases in population or economic activity, in effect misleading the public and decision-makers by obscuring the impacts of the project itself. When comparing future build conditions to future no-build conditions, the difference is the addition of the project itself and associated changes that may occur to land use and travel behavior. The environmental document will need to include information on the traffic modeling, including the planning projections included in the model.

Regardless of whether a quantitative or qualitative analysis is performed, in order to fully provide context and information, beyond the future build condition, the CEQA analysis for VMT must also include the current condition and the future no-build condition. In other words, the future build alternative should be compared to the future no-build conditions (i.e., the conditions expected to exist in the future absent the project) to determine the amount of VMT attributable to the project per the CEQA Guidelines and the Technical Advisory. Additionally, and for informational purposes, the comparison to the existing condition should also be provided. However, a comparison only to existing conditions would not provide an accurate picture of the project's effects. Only by taking into account other variables not caused by the project, such as the projected future regional transportation system, population growth, economic growth and land use changes, can the VMT that is attributable to the project be separated from a general increase or decrease in VMT in a region overall. In order to fully apprise the reader of the total change in VMT anticipated, VMT for existing conditions should also be provided.



## 5.3 DIRECT IMPACTS TO VEHICLE MILES TRAVELED, INCLUDING INDUCED TRAVEL

Any analysis of VMT impacts must 1) determine whether the project will cause a significant transportation impact, and 2) be supported by “substantial evidence” as defined in Guidelines § 15384. The CEQA Guidelines allow a qualitative approach to analyzing transportation impacts when quantitative methods are unavailable. A qualitative analysis describes why or why not an increase in VMT is likely; how much induced travel is created, if any; and whether that increase, if any, will have a significant impact.

### 5.3.1 INDUCED TRAVEL

Some projects have the potential to result in a significant transportation impact because they are likely to induce vehicle travel. Induced travel, or induced vehicle travel, is the “Additional vehicle travel that occurs when the cost [for travel] is lower,” after travel constraints, such as congestion, are reduced.<sup>12</sup> It is the increase in travel that occurs when auto travel is made more convenient by new roadway capacity. The extent that this occurs due to new roadway capacity versus other variables such as the economy (wage changes, gas prices, parking prices) and population growth varies across the body of research, but in general, changes in travel times and costs affect demand and therefore VMT. For this reason, capacity-increasing projects generally need to be evaluated for their potential induced travel. The mechanisms by which induced travel occur include:

- Route changes (may increase or decrease overall VMT)
- Mode shift to automobile use (increases overall VMT)
- Longer trips (increases overall VMT)
- More trips (increases overall VMT)
- Location and land use changes (increases overall VMT)

Induced travel can reduce the benefits of capacity expansion projects and increase VMT over time. While a project may reduce trip duration and increase travel speed on a short-term basis, this effect may be temporary as drivers may change their travel behavior in response to the newly expanded facility, particularly during peak periods of travel (work commutes). In the long run, an expanded facility may also facilitate land development around the project. Ultimately, induced demand can lead to more and longer trips, increasing VMT; thereby, reducing travel time benefits of capacity increasing projects.<sup>13</sup> See Section 2.2 of the TAF for further details on induced travel.

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<sup>12</sup> Ronald T. Milam and Jerry Walters, et al., “Induced Travel Technical Investigation Final,” Prepared For Caltrans (April 24, 2016), 1.

<sup>13</sup> This discussion is adapted from Cervero, “Road Expansion, Urban Growth, and Induced Travel,” *Journal of the American Planning Association* Vol. 69, No. 2 (Spring 2003): 146 and Duranton and Turner, “The Fundamental Law of Road Congestion: Evidence from US Cities,” *American Economic*

### 5.3.2 QUANTITATIVE OR QUALITATIVE ANALYSIS.

TAC Figure 3, reproduced from the TAF, provides insight on when to apply quantitative versus qualitative methods. Users should refer to the TAF for additional guidance regarding analysis of VMT impacts. There are two potential quantitative methods identified below, the travel demand model (TDM) and the National Center for Sustainable Transportation (NCST) Induced Travel Calculator. The [NCST calculator](https://ncst.ucdavis.edu/research-product/induced-travel-calculator) is an elasticity-based tool that estimates annual induced VMT for capacity expansion projects. More information on the calculator is available at: <https://ncst.ucdavis.edu/research-product/induced-travel-calculator>.

**Table 1. Selection Matrix for Preferred Induced Travel Assessment Method for Projects on the SHS<sup>1</sup>**

<b>Project Location \ Project Type</b>	<b>GP or HOV Lane Addition to Interstate Freeway</b>	<b>GP or HOV Lane Addition to Class 2 &amp; 3 State Routes</b>	<b>Other VMT Inducing Projects and Alternatives</b>
<b>County in MSA with Class I Facility</b>	Apply the NCST Calculator by MSA and/or TDM <sup>2</sup> benchmarked with NCST Calculator.	Apply the NCST Calculator by county and/or TDM <sup>2</sup> benchmarked with NCST Calculator.	Apply TDM <sup>2</sup> or other quantitative methods
<b>Other MSA County</b>	Apply TDM <sup>2</sup> or other quantitative methods		
<b>Rural County</b>	Apply TDM <sup>2</sup> or other quantitative methods		

<sup>1</sup>If preferred methods are not available, qualitative assessment is acceptable as shown in TAF Figure 5.

<sup>2</sup>TDMs must be checked for applicability as described in TAF Sections 4.4 and 4.5.

Travel demand models must be checked for capability to assess induced travel as described in Sections 4.4 and 4.5 of the TAF.

The environmental document should include a discussion of the selection of induced travel methodology utilized in the traffic analysis.

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Review Vol. 101, No. 6 (2011), 2616-2617. It should be noted that there may be other benefits to congestion relief and capacity increasing projects.

### 5.3.3 CONSTRUCTION IMPACTS

Impacts associated with construction of a project may also require VMT analysis, particularly for large projects or projects located a considerable distance from urbanized areas. Generally, a qualitative analysis of VMT impacts associated from the construction of the project would be appropriate. Although in some cases lane closures may result in out-of-direction travel as people seek to avoid the construction area, the reduction in capacity would usually disincentivize highway travel; thereby, possibly reducing VMT. Public information campaigns prior to and during roadway construction periods can effectively alert travelers to options such as available transit services and reducing trips during peak construction periods. Vehicle trips used for construction purposes would be temporary, and any generated VMT would generally be minor and limited to construction equipment and personnel and would not result in long-term trip generation.

## 5.4 CUMULATIVE AND INDIRECT IMPACTS

The term *cumulative impacts* refers to two or more individual effects which, when considered together, are considerable, compound, or increase other environmental effects. Pursuant to Guidelines section 15064(h), impacts are “cumulatively considerable” when the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.

For transportation impacts and with respect to VMT, a cumulative impact is a project’s potential, when combined with other projects in an area or region, to significantly increase VMT. In other words, a project may contribute to a potential impact through its incremental addition to regional VMT when examined in combination with the effects of other past, present, and probable future projects. A project at an interchange, for example, may not significantly induce new VMT on its own, but when considered cumulatively with other past, present, or future probable projects in a travel corridor or region, it may be cumulatively considerable and therefore significant.

If a project has no potential to induce new VMT, or if it reduces VMT, then a cumulative analysis is not required, as the project could not contribute to a cumulatively considerable transportation impact.

Lead agencies are not required to mitigate for effects caused by other past or future projects—mitigation is required only for the project under consideration. When a project might contribute to a significant cumulative impact, but the contribution will be rendered less than cumulatively considerable through project-specific mitigation, then the impact can be considered less than significant.

A project’s cumulative impacts may also be rendered less than cumulatively considerable if the project was analyzed as part of, and will comply with the

requirements of, a previously-approved plan or mitigation program which includes enforceable requirements that will avoid or substantially lessen the cumulative impact within the geographic area in which the project is located (Guidelines §15064(h)(3)). See section 5.1.2. above for considerations related to compliance with a previously approved plan or mitigation program.

## 5.5 CONSISTENCY WITH PLANS

Section 15125(d) of the CEQA Guidelines requires that an EIR,

*...discuss any inconsistencies between the proposed project and applicable general plans, specific plans, and regional plans. Such regional plans include, but are not limited to, the applicable air quality attainment or maintenance plan or State Implementation Plan, area-wide waste treatment and water quality control plans, regional transportation plans, regional housing allocation plans, regional blueprint plans, plans for the reduction of GHG emissions, habitat conservation plans, natural community conservation plans and regional land use plans for the protection of the Coastal Zone, Lake Tahoe Basin, San Francisco Bay, and Santa Monica Mountains.*

Consistency with CARB's 2017 Scoping Plan as it pertains to both GHG emissions and any increase in VMT attributable to the project should be discussed in the "Consistency with State, Regional, and Local Plans and Programs" section of the environmental document, with references back to the Transportation and Climate Change sections, as needed. Capacity-increasing projects with the potential to lead to a measurable and substantial increase in VMT are likely to be inconsistent with State climate goals. Modeling completed by CARB for the Mobile Source Strategy shows capacity for statewide light-duty VMT growth is only five percent by 2030, as compared to the current growth rate of approximately eleven percent.<sup>14</sup> As stated previously, consistency with an RTP/SCS does not imply consistency with State climate goals.

## 5.6 DETERMINING SIGNIFICANCE

At the project level, the purpose of the CEQA analysis is to determine, and identify feasible mitigation for, adverse environmental impacts, such as increases in VMT attributable to the project. CEQA does not require an improvement over baseline or existing conditions, just that a lead agency consider reasonable project alternatives and mitigate significant environmental effects of the project to the extent feasible. A "significant effect on the environment" means "A substantial, or potentially substantial, adverse change in any of the physical conditions within the area

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<sup>14</sup> California Air Resources Board, "Mobile Source Strategy," May 2016, pg. 37

affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance.”

### **5.6.1 DETERMINING SIGNIFICANCE FOR PROJECTS IN RURAL (NON-MPO) COUNTIES**

For projects within the rural, non-MPO counties, significance should be addressed on a case-by-case basis, taking into account context and environmental setting.

### **5.6.2 DETERMINING SIGNIFICANCE FOR PROJECTS IN MPO AREAS**

The determination of significance will be based on the projection of induced travel attributable to the project.

Within the MPO areas (including RTPAs within MPOs), a project that results in an increase in VMT when comparing the future build alternative to the future no-build alternative (i.e., the VMT is higher under the future build scenario) will generally be considered significant, and mitigation will be required. Small increases of VMT attributable to a project that are consistent with the level of increase associated with the project types on the screened list (Section 5.1), would likely not be deemed significant.

Determining significance is a three-step process. First, the impact is evaluated without any consideration of mitigation, to determine if the impact is significant or not. If the impact is significant, mitigation is required and then “applied” to the project. The level of induced travel projected generally represents the level of VMT to be mitigated in order to reduce transportation impacts to a level that is less than significant. The remaining impact is then evaluated again to determine if it remains significant or if the mitigation has reduced the impact to a less than significant level. If the impact remains significant after all feasible mitigation has been incorporated, and there are no additional, feasible alternatives which would avoid or lessen the adverse impact, a statement of overriding considerations may be appropriate to approve the project. There are instances in which an element of a project or a project feature may reduce adverse transportation impacts and should be taken into account prior to the initial significance determination.

## **5.7 MITIGATION**

A lead agency under CEQA has the authority to require feasible changes in any or all activities involved in the project in order to substantially lessen or avoid significant adverse impacts on the environment. Where changes to the project or project alternatives cannot avoid or substantially lessen the significant impact, mitigation is required. There must be a rational relationship between the impact and the mitigation for that impact (i.e., “nexus”), and the mitigation must be roughly proportional to the impact (i.e., “proportionality”) (Guidelines §15041 (a)).

Mitigation must be feasible and enforceable. “Feasible” under CEQA means “Capable of being achieved in a successful manner within a reasonable amount of time, taking into account economic, environmental, legal, social, and technological factors” (Guidelines § 15364). When specific economic, social, or other conditions make mitigation measures or project alternatives infeasible, individual projects may be approved in spite of one or more significant effects of the project (PRC § 21002; see also, Appendix A, “Considerations for Statements of Overriding Considerations”).

As noted in the “Project Scoping” section of this document (Section 4), as a project proceeds toward final design it becomes increasingly difficult to achieve feasible, proportional project-level VMT mitigation for a capacity-increasing roadway project. Therefore, for capacity-increasing projects, early coordination and scoping of mitigation opportunities is advisable whether on-system or off-system mitigation is pursued. The following subsections of this document discuss on-system and off-system mitigation. Off-system mitigation, in particular, requires considerable time to identify willing partners and opportunities, perform analyses of the opportunities, and negotiate and execute agreements to fulfill mitigation commitments.

On-system mitigation are measures which can be implemented within the Caltrans right-of-way. On-system mitigation may include mitigation within or outside the initial project limits of any given capacity increasing project. Caltrans, as owner and operator of the SHS and associated right-of-way, exercises more direct authority over on-system measures as opposed to off-system measures. Off-system mitigation, outside Caltrans’ right-of-way, requires cooperation with those jurisdictions that have influence over land use and transportation systems outside of Caltrans direct control.

### **5.7.1 MITIGATION OFF THE SHS**

The Caltrans Division of Transportation Planning recently completed a literature review and assessment of VMT and GHG reduction strategies. The measures that resulted in the largest decreases in VMT are generally off-system and not under Caltrans’ direct control, such as land use authority, cordon pricing<sup>15</sup> authority, parking management/pricing, and employer-based transportation demand management strategies. Close coordination with federal, state, and regional transportation partners would be required to implement such off-system VMT mitigation.

Similarly, the most cost-effective measures identified in the literature review also tended to be outside of Caltrans’ direct control (e.g., transit-oriented development, transportation demand management).

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<sup>15</sup> “Cordon pricing” is a form of zone-based pricing in which drivers are charged either fixed or variable fees to drive within or into a congested area within a city (FHWA, “Zone-Based Pricing” available at: [https://ops.fhwa.dot.gov/congestionpricing/strategies/involving\\_tolls/zone\\_based.htm](https://ops.fhwa.dot.gov/congestionpricing/strategies/involving_tolls/zone_based.htm)).

There will be a need for cost-effective, feasible, and proportional VMT mitigation measures, not just for Caltrans' projects, but for local lead agencies statewide that must comply with CEQA. Caltrans may ultimately develop or participate in a VMT credit or banking and exchange system<sup>16</sup> operated by Caltrans, an MPO, RTPA, or another entity. Under a banking system, Caltrans could purchase mitigation credits to reduce project impacts related to VMT. The revenues from the credit purchases could be utilized by the bank to facilitate the development of VMT-reducing projects. For example, the bank could invest in infrastructure improvements such as pedestrian facilities or aid in the development of regional transportation options, such as light rail. An exchange system might be similarly structured. In exchange for implementing a project that induces VMT, Caltrans would invest in a project identified by a local or regional transportation partner that reduces VMT. One example of a system that relies on VMT reduction as a nexus is the City of Los Angeles Westside Mobility Plan Transportation Impact Fee Program.

VMT-reduction measures in rural areas may benefit from a coordinated approach. OPR has posted a document that includes strategies for different types of rural communities which can be found at: [http://opr.ca.gov/docs/Mitigating\\_Vehicle-Miles\\_Traveled\\_\(VMT\)\\_in\\_Rural\\_Development.pdf](http://opr.ca.gov/docs/Mitigating_Vehicle-Miles_Traveled_(VMT)_in_Rural_Development.pdf).

## 5.7.2 MITIGATION ON THE SHS

As indicated previously, on-system mitigation tends to be more within Caltrans' direct authority. However, this does not mean that Caltrans may unilaterally decide to implement measures within its right-of-way. For example, tolling strategies will require early coordination or consideration as a project scoping alternative, with appropriate transportation planning agencies and may require approval from other agencies such as the California Transportation Commission or the Federal Highway Administration. In many cases, tolling strategies have the potential to provide substantial VMT reduction.

In addition to the measures noted above, all projects should consider strategies within the direct control of Caltrans and on the SHS. Measures listed in TAC Table 2 may be implemented to reduce VMT. Incorporating these types of measures as early as possible in the project development process will increase their feasibility. In certain circumstances, on-system measures may be able to sufficiently mitigate VMT attributable to a project or provide additional mitigation in situations where strategies beyond Caltrans' direct control are limited.

Additional measures and their approximate VMT-reduction potential can be found in the Caltrans Division of Transportation Planning's *Literature Review and Assessment of VMT and GHG Mitigation Strategies* as well as the transportation measures found in the California Air Pollution Control Officers Association's (CAPCOA) *Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess*

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<sup>16</sup> Vehicle miles traveled banking and exchange systems are discussed in more detail in papers referenced in Appendix C.

*Emission Reductions from Greenhouse Gas Mitigation Measures.* See Appendix C in this document for more information on these and other resources related to mitigation.



**Table 2. Project-Level Measures to Reduce VMT on the SHS**

<b>Description</b>
1. Include detours for bicycles and pedestrians in all areas potentially affected by project construction.
2. Incorporate Complete Streets Elements
3. Consider and accommodate alternate modes of transportation consistent with the purpose and need of the project: <ul style="list-style-type: none"> <li>• Bicycle paths and facilities</li> <li>• Pedestrian infrastructure and pedestrian-friendly features (wide sidewalks, overpasses on busy roads, signalized intersections with appropriate signal timing, etc.)</li> <li>• Routes connecting to public transportation</li> </ul>
4. Include measures to support multi modal transportation that will offset project impacts: additional Park & Ride lots
5. Social marketing efforts and incentives promoting mass transportation and carpooling. (Possible use of Cap and Trade Funds)
6. Social marketing and public education activities to improve awareness of the impacts of driving habits and opportunities to reduce climate change impacts.
7. Incorporate infrastructure electrification into project design (e.g., charging for electric bikes).
8. Implement intelligent transportation systems and transportation demand management elements to smooth traffic flow and increase system efficiency.
9. Implement Traffic Management Strategies: <ul style="list-style-type: none"> <li>• Modify roadways to allow more efficient bus operation, including bus lanes and signal priority/preemption where necessary. Coordinate improvements on the SHS with arterials roadways.</li> <li>• Create an interconnected transportation system that allows a shift in travel from private passenger vehicles to alternative modes, including public transit, ride sharing, car sharing, bicycling and walking, if determined feasible and applicable by the Lead Agency.</li> </ul>

## 5.8 RELATED MITIGATION

It is important to note that mitigation that reduces VMT may also be identified as mitigation for adverse impacts associated with noise, energy, GHG emissions, criteria air pollutants, or toxic air contaminants resulting from the project.

## 5.9 STATEMENTS OF OVERRIDING CONSIDERATIONS

If the lead agency cannot identify and implement feasible and enforceable mitigation to reduce the impact to a level that is less than significant, then it should document and disclose those impacts as significant and unavoidable. Under CEQA, if a lead agency approves a project which will result in significant effects that are identified in the final EIR but are not avoided or substantially lessened, and if those impacts are outweighed by the economic, legal, social, technological, or other benefits of the project, including region-wide or statewide environmental benefits, the lead agency shall state in writing the specific reasons to support its decision

based on the final EIR and/or other information in the record. This “statement of overriding considerations” shall be supported by substantial evidence in the record and included in the record of the project approval. It should also be mentioned in the Notice of Determination filed with OPR.

## APPENDIX A. CONSIDERATIONS FOR STATEMENTS OF OVERRIDING CONSIDERATIONS

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A statement of overriding considerations may be prepared when the project's effects are significant and not fully mitigable. According to Guidelines Section 15021(d):

*CEQA recognizes that in determining whether and how a project should be approved, a public agency has an obligation to balance a variety of public objectives, including economic, environmental, and social factors and in particular the goal of providing a decent home and satisfying living environment for every Californian.*

The specific requirements for a statement of overriding considerations are found in the Guidelines Section 15093:

- (a) CEQA requires the decision-making agency to balance, as applicable, the economic, legal, social, technological, or other benefits, including region-wide or statewide environmental benefits, of a proposed project against its unavoidable environmental risks when determining whether to approve the project. If the specific economic, legal, social, technological, or other benefits, including region-wide or statewide environmental benefits, of a proposed project outweigh the unavoidable adverse environmental effects, the adverse environmental effects may be considered "acceptable."*
- (b) When the lead agency approves a project which will result in the occurrence of significant effects which are identified in the final EIR but are not avoided or substantially lessened, the agency shall state in writing the specific reasons to support its action based on the final EIR and/or other information in the record. The statement of overriding considerations shall be supported by substantial evidence in the record.*
- (c) If an agency makes a statement of overriding considerations, the statement should be included in the record of the project approval and should be mentioned in the notice of determination. This statement does not substitute for, and shall be in addition to, findings required pursuant to Section 15091.*

Good places to start for the statement of overriding considerations are both the Purpose and Need statement for the project as well as the rationale used for the selection of the preferred alternative. Beyond the Purpose and Need Statement, lead agencies have substantial discretion in weighing specified economic, environmental and social factors which are relevant to their decision making. Any supporting factors relied upon by the lead agency should be documented in the agency's records relating to the project.

## APPENDIX B. CEQA GUIDELINES, APPENDIX G CHECKLIST QUESTIONS

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The Traffic and Transportation section of the environmental document should address the following remaining CEQA Checklist questions for each alternative under consideration, including the no-build alternative.

### **Would the project:**

#### ***Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?***

The practitioner should assess and discuss the consistency of the alternatives with the relevant plans that address the circulation system including any Caltrans plans for the project area, the circulation element of the general plan, area-specific plans, transit planning document, district-specific bicycle and/or pedestrian plans, regional transportation plans, etc. Be certain to discuss the relevant project features (including standardized measures) that have been incorporated into the project to avoid or minimize the project's environmental impacts. If an alternative was modified to achieve consistency with an adopted program, plan, ordinance or policy addressing the circulation system, describe that here. *Please note that consistency with California's 2017 Climate Change Scoping Plan will be addressed in the Greenhouse Gas section of the environmental document under the applicable CEQA Checklist question.*

#### ***Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?***

In general, a transportation project is unlikely to substantially increase hazards.

Include information here from the project's purpose and need and project description to determine how a project will address non-standard geometric features such as horizontal and vertical curves, median width, shoulder width, access control, measures included to reduce flooding events, interchange improvements, separated bike lanes and/or other improvements for bicyclists and/or pedestrians or incompatible uses (for example, including wider shoulders for farm equipment in rural areas).

If the project is a safety project, explain how the project will improve safety. A project-level traffic analysis should include a safety analysis based on the Caltrans Traffic Accident Surveillance and Analysis System or other historical safety performance results. The implementation of performance-based decision-making using the Highway Safety Manual is encouraged to facilitate the integration of quantitative collision frequency and severity performance measures into roadway planning, design, operations, and maintenance decisions.

***Result in inadequate emergency access?***

In general, most projects either improve, or do not diminish, emergency access and/or response times. For example, projects that provide prioritized signalization to emergency vehicles can decrease emergency response time. Projects that create another means of ingress and egress can also improve emergency access. Projects that widen shoulders can provide additional areas for emergency response vehicle staging. There could be temporary construction impacts related to emergency access. This should be addressed in the Transportation Management Plan for the project and Caltrans should coordinate with local emergency officials as part of the development of that plan.

## APPENDIX C. MITIGATION

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Strategies to mitigate VMT are available within the following resources. Additional mitigation resources will be added to Caltrans SB 743 Implementation webpage. The following pages include additional information on the CAPCOA report (as referenced in item “a” below) and the literature review (as referenced in item “b” below).

- a. California Air Pollution Control Officers Association's (CAPCOA) [2010 Quantifying GHG Mitigation Measures](#) is a current source of VMT reduction by mitigation strategy. (See attached table 6-2 from the CAPCOA report summarizing mitigation options).
- b. Literature Review and Assessment of VMT and GHG Mitigation Strategies. Prepared in December 2019 by Caltrans Division of Transportation Planning. (See following page for more information).
- c. Governor's Office of Planning and Research's CEQA Guidelines Update and Technical Advisory [website](#) has information on VMT reduction strategies, even for rural areas.
- d. A 2018 [research paper](#) from University of California Berkeley School of Law's Center for Law, Energy & the Environment focuses on two innovative models that could be used to implement programmatic VMT mitigation strategies for land use or transportation projects. VMT mitigation “banks” and “exchanges” are compared, and examples provided of ways to mitigate VMT under CEQA or the mitigation fee act. These models are conceptually similar to existing mitigation frameworks such as regional impact fee programs or habitat conservation banks.
- e. A 2020 white paper prepared by Fehr & Peers [VMT Mitigation Through Banks and Exchanges: Understanding New Mitigation Approaches](#) highlights potential VMT mitigation programs including impact fee programs, mitigation exchange, and mitigation banks.
- f. State Smart Transportation Initiative (SSTI) 2018 report [Modernizing Mitigation: A Demand-Centered Approach](#) outlines partnerships possible to reduce the demand for driving.

Transportation Measures (Five Subcategories) Global Maximum Reduction (all VMT): urban = 75%; compact infill = 40%; suburban center or suburban with NEV = 20%; suburban = 15%					Global Cap for Road Pricing needs further study	
Transportation Measures (Four Categories) Cross-Category Max Reduction (all VMT): urban = 70%; compact infill = 35%; suburban center or suburban with NEV = 15%; suburban = 10%				Max Reduction = 15% overall; work VMT = 25%; school VMT = 65%;	Max Reduction = 25% (all VMT)	
Land Use / Location	Neighborhood / Site Enhancement	Parking Policy / Pricing	Transit System Improvements	Commute Trip Reduction (assumes mixed use) Max Reduction = 25% (work VMT)	Road Pricing Management Max Reduction = 25%	Vehicles
Max Reduction: urban = 65%; compact infill = 30%; suburban center = 10%; suburban = 5%	Max Reduction: without NEV = 5%; with NEV = 15%	Max Reduction = 20%	Max Reduction = 10%			
Density (30%)	Pedestrian Network (2%)	Parking Supply Limits (12.5%)	Network Expansion (8.2%)	CTR Program Required = 21% work VMT Voluntary = 6.2% work VMT	Cordon Pricing (22%)	Electrify Loading Docks
Design (21.3%)	Traffic Calming (1%)	Unbundled Parking Costs (13%)	Service Frequency / Speed (2.5%)	Transit Fare Subsidy (20% work VMT)	Traffic Flow Improvements (45% CO2)	Utilize Alternative Fueled Vehicles
Location Efficiency (65%)	NEV Network (14.4) <NEV Parking>	On-Street Market Pricing (5.5%)	Bus Rapid Transit (3.2%)	Employee Parking Cash-out (7.7% work VMT)	Required Contributions by Project	Utilize Electric or Hybrid Vehicles
Diversity (30%)	Car Share Program (0.7%)	Residential Area Parking Permits	Access Improvements	Workplace Parking Pricing (19.7% work VMT)		
Destination Accessibility (20%)	Bicycle Network <Lanes> <Parking> <Land Dedication for Trails>		Station Bike Parking	Alternative Work Schedules & Telecommute (5.5% work VMT)		
Transit Accessibility (25%)	Urban Non-Motorized Zones		Local Shuttles	CTR Marketing (5.5% work VMT)		
BMR Housing (1.2%)			Park & Ride Lots*	Employer-Sponsored Vanpool/Shuttle (13.4% work VMT)		
Orientation Toward Non-Auto Corridor				Ride Share Program (15% work VMT)		
Proximity to Bike Path				Bike Share Program		
				End of Trip Facilities		
				Preferential Parking Permit		
				School Pool (15.8% school VMT)		
				School Bus (6.3% school VMT)		

*Note: Strategies in bold text are primary strategies with reported VMT reductions; non-bolded strategies are support or grouped strategies.*

**Figure C-1. Chart 6-2 of the CAPCOA Report**

# **LITERATURE REVIEW AND ASSESSMENT OF VMT AND GHG MITIGATION STRATEGIES**

*Prepared in December 2019 by Caltrans Division of Transportation Planning*

This report contains the results of a detailed, comprehensive review and synthesis of literature in order to compile estimates of the impacts of VMT and transportation GHG emission reduction strategies at the program, plan, and project level. The study focused on strategies that influence emissions from users of the transportation system, as opposed to strategies that target transportation project construction and maintenance activity. In addition, the study focused on strategies that can reduce GHG emissions either by reducing VMT or by changing traffic speed or flow; the study did not review strategies that seek to increase the deployment of low emission vehicles or alternative fuels.

## **METHODOLOGY**

This research reviewed a wide variety of sources, including original peer-reviewed literature, previous meta-analyses and compilations, practitioner-oriented guidance documents, plans and feasibility studies, and select calculator tools that provide information on VMT and GHG emissions impacts. The extent and quality of research varies widely across the types of strategies considered. For some types of strategies (e.g., certain land use changes), more than 10 original research studies have quantified effects on VMT. Other types of strategies (e.g., bicycle and pedestrian facilities) have received far less attention from researchers seeking to quantify VMT or GHG emission impacts.

## **IMPLEMENTATION ROLE FOR CALTRANS**

The implementation of VMT and GHG emission reduction strategies can be led by a variety of public and private sector organizations. The scale of strategy implementation can include employer-level, development project, neighborhood, transportation project, corridor, city, metropolitan area, or state-wide. Caltrans may have a lead or supporting role in implementation depending on the type of strategy and scale of application. The table below shows the strategies for which Caltrans has a supporting role and strategies for which Caltrans could lead implementation:



**Table C-1. Mitigation Strategies by Caltrans Role**

Strategy Category	Strategies for which Caltrans has a Support Role	Strategies for which Caltrans has a Lead or Support Role
<b>Bicycle, Pedestrian, and Urban Design Strategies</b>	Bikeshare	Bikeway network expansion Bike lane/path development Pedestrian facility network expansion Pedestrian facility development Street connectivity
<b>Transit Strategies</b>	Transit system expansion Transit frequency improvements Transit travel time improvements Transit reliability improvements Transit fare reduction	
<b>Land Use and Parking Strategies</b>	Land use mixing Higher density development Transit oriented development Destination accessibility Parking management and pricing	
<b>Transportation Demand Management Strategies</b>	Employer alternative commute option programs Rideshare Carsharing programs Telework Community-based travel marketing	Park and ride lots
<b>Transportation System Management Strategies</b>		Roadway pricing Arterial signal timing Ramp metering Traffic incident management programs HOV and HOT lanes

**SUMMARY OF FINDINGS**

The following table lists each of the strategies, the number of sources identified within the report that quantify the impact of those strategies with respect to VMT/GHG, and key findings.

**Table C-2. Quantifiable mitigation strategies with respect to VMT/GHG**

Strategy	Number of sources identified that quantify VMT or GHG impacts	Key Findings
<b>Bikeway network expansion</b>	2	Doubling bikeway density (in terms of bikeway miles per square mile or per capita) can reduce city-wide VMT by 0.05% to 0.1%

Strategy	Number of sources identified that quantify VMT or GHG impacts	Key Findings
<b>Bike lane or bike path development</b>	2	A new class 2 or 4 bikeway can reduce GHG emissions by 1 to 85 metric tons (MT) per year. The wide range reflects different assumptions for facility usage.
<b>Bikeshare program expansion</b>	3	The Bay Area Bike Share pilot program reduced GHG emissions by 79 tons in the first year. Several other documents report negligible impacts on VMT and GHG emissions.
<b>Pedestrian facility network expansion</b>	5	A 10% increase in sidewalk coverage can reduce area-wide VMT by 0.2% to 0.5%.
<b>Pedestrian facility development</b>	1	CARB's calculator tool estimates a pedestrian facility project will reduce 4 to 22 MT of GHG emissions per year.
<b>Street connectivity improvement</b>	11	A 10% increase in intersection density (in terms of intersections per square mile) can reduce area-wide VMT by 1.2%
<b>Transit frequency improvements</b>	3	Doubling transit frequency can reduce VMT by 0.5% to 2.5% in affected areas.
<b>Transit travel time reduction</b>	1	One study found that a 10% reduction in transit travel time is associated with an approximately 2.5% reduction in VMT and vehicle GHG emissions in affected areas.
<b>Transit service expansion</b>	3	In larger urban areas, increases in bus route miles of 10-42% were found to reduce region-wide VMT by an average of 0.13%.
<b>Transit fare reduction</b>	2	A calculator tool suggests that a 50% reduction in transit fares would typically reduce community wide VMT by 0.2%.
<b>Land use mixing</b>	8	A 10% increase in land use mixing (measured using an entropy index) is associated with 0.1% to 1.7% lower VMT.
<b>Higher density development</b>	8	A 10% increase in residential density is associated with 0.5% to 1.2% lower VMT.
<b>Transit oriented development</b>	5	Residents of transit-oriented development (TOD) in California are observed to have a transit mode share that is 4.9 times higher than residents of surrounding areas. Residential building in a transit-oriented location can reduce project VMT by up to 15% compared to building the project in a non-TOD location.
<b>Destination accessibility</b>	10	Locating a residential development 10% closer to the central business district is associated with a 2.3% reduction in VMT. A 10% improvement in regional jobs accessibility is associated with a 1.3% to 2.5% reduction in VMT.
<b>Parking management and pricing</b>	11	Doubling of parking prices can reduce VMT by 3% at lower parking price levels and 15% at higher parking price levels. Employer-based parking cash out programs are observed to reduce VMT by 12% for employees who opt in.

Strategy	Number of sources identified that quantify VMT or GHG impacts	Key Findings
<b>Employer alternative commute option programs</b>	8	Implementation of a voluntary employer-based alternative commute option program has been shown to reduce VMT associated with the employer site by 4% to 6%. Larger VMT reductions are reported for programs that involve mandatory monitoring, reporting, and targets.
<b>Rideshare</b>	8	Carpool and vanpool programs can reduce VMT by 3% to 8% at participating employers. Region-wide, rideshare programs are typically estimated to reduce VMT by less than 1%.
<b>Telework</b>	7	Participants in telework programs reduce their daily VMT by 50% to 75% on telecommute days. The community or region-wide VMT and GHG impacts of telecommute programs depend heavily on assumptions regarding levels of participation and have not been studied in recent years.
<b>Carsharing programs</b>	6	Participants in carsharing programs reduce their personal or household VMT and GHG emissions. Studies for MPOs suggest that expansion of carsharing programs can reduce community or region-wide VMT by 0.5% to 2%.
<b>Community-based travel marketing</b>	2	Studies of community-based travel marketing programs have found reductions in SOV trips of roughly 10% in targeted neighborhoods. Large-scale program deployment in the Bay Area was estimated to reduce per capita light duty vehicle GHG emissions by 1.2% to 1.7%.
<b>Park and ride facilities</b>	4	Among park and ride lots serving carpoolers, the observed average annual VMT reduction per lot was 156,000 in New York (7 lots) and 608,000 in Maine (39 lots). The annual VMT reduction per parking lot space is estimated to range from 2,700 to 7,200.
<b>Roadway pricing</b>	8	Tolling of the roadway system for the purpose of VMT and GHG reduction has not been implemented in the U.S., and thus the potential impacts are not well understood. Simulation modeling in the Seattle region found that tolling applied to all freeways would reduce regional VMT by 6%. Implementation of cordon pricing has resulted in a VMT reduction of approximately 15% in several international cities.
<b>Arterial signal timing</b>	5	During the time period of implementation, traffic signal coordination has been shown to reduce GHG emissions by 1% to 10% on the facility affected. Reductions may be over-estimated because they do not account for induced vehicle traffic effects.
<b>Ramp metering</b>	1	A study in South Korea found that ramp metering reduced system-wide GHG emissions by 7.3%.

Strategy	Number of sources identified that quantify VMT or GHG impacts	Key Findings
<b>Traffic incident management programs</b>	6	Statewide incident management programs in Florida and Maryland are estimated to reduce annual GHG emissions by 238,000 and 65,000 MT, respectively. At the corridor level, estimated GHG reductions range from 0.07% to 4%.
<b>HOV and HOT lanes</b>	7	There is little recent academic research regarding the VMT and GHG impacts of HOV and HOT lanes. Projects that added HOV lanes to freeways in the 1980s or 1990s resulted in an increase in average vehicle occupancy (AVO) by an average of 9%. Other research concludes that HOV lanes do not encourage carpooling because HOV travel time savings do not provide a statistically significant carpooling incentive. Conversion of HOV to HOT (express) lanes appears to reduce carpooling. Development of new HOV lanes typically increases VMT and GHG emissions as compared to a no-build alternative.

## CONCLUSIONS

This report illustrates the breadth and variety of literature covering VMT and transportation GHG reduction strategies. The relevant documents differ widely in terms of the level of rigor applied for determining results, which can make it challenging to compare and summarize results across multiple sources.

For many of the strategies that Caltrans could lead or support to reduce VMT and GHG emissions, there has been relatively little research to quantify VMT or GHG emissions impacts. Relevant research is particularly limited for bicycle and pedestrian strategies, as well as for transit strategies and some types of transportation system management strategies such as ramp metering. There is generally more VMT and GHG emission impacts research for land use strategies and employer-based transportation demand management strategies.

In addition to the limited sources, several factors can make it challenging to apply research findings to estimate VMT or GHG emissions impacts in the context of Caltrans' decision-making processes. Results are sometimes reported as a wide range, with other factors having a strong influence on the level of VMT or GHG reduction. This can make it difficult to generalize about the effectiveness of one strategy versus another. Research results are also sometimes reported at a scale that is inconsistent with Caltrans' processes.

## APPENDIX D-1. EXAMPLE PROJECT 1: CONSTRUCTION OF HIGH-OCCUPANCY VEHICLE (HOV) LANES IN SUNSHINE COUNTY

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**NOTE:** The purpose of this example project is to show the process for determining significance under CEQA for operational impacts resulting from induced vehicle demand. Discussions and analysis are intended to show the basic steps in the process and are not intended to reflect the complexity or detail that may be required for specific projects, including the need to analyze construction impacts and/or cumulative impacts. The VMT provided in this analysis are illustrative only and are not drawn from a specific project.

### PROJECT DESCRIPTION:

In this example, Caltrans is proposing to construct 10 miles of high-occupancy (HOV) lanes in each direction (for a total of 20 miles), on a Class I Interstate facility in Sunshine County, California. The purpose of the project is:

- Increase the mode share of high-occupancy vehicles such as carpools, vanpools, and transit;
- Enhance the reliable movement of inter-regional goods and increasing access to jobs and housing in the corridor; and
- Provide greater HOV network connectivity in the Sunshine metropolitan area.

The project as proposed has four alternatives. The HOT lane alternative was added when the project reached the Project Approval and Environmental Document (PA&ED) phase in order to include a priced and revenue-generating alternative as recommended in the Preliminary Environmental Analysis Report (PEAR) for this project (see “Project Scoping” below).

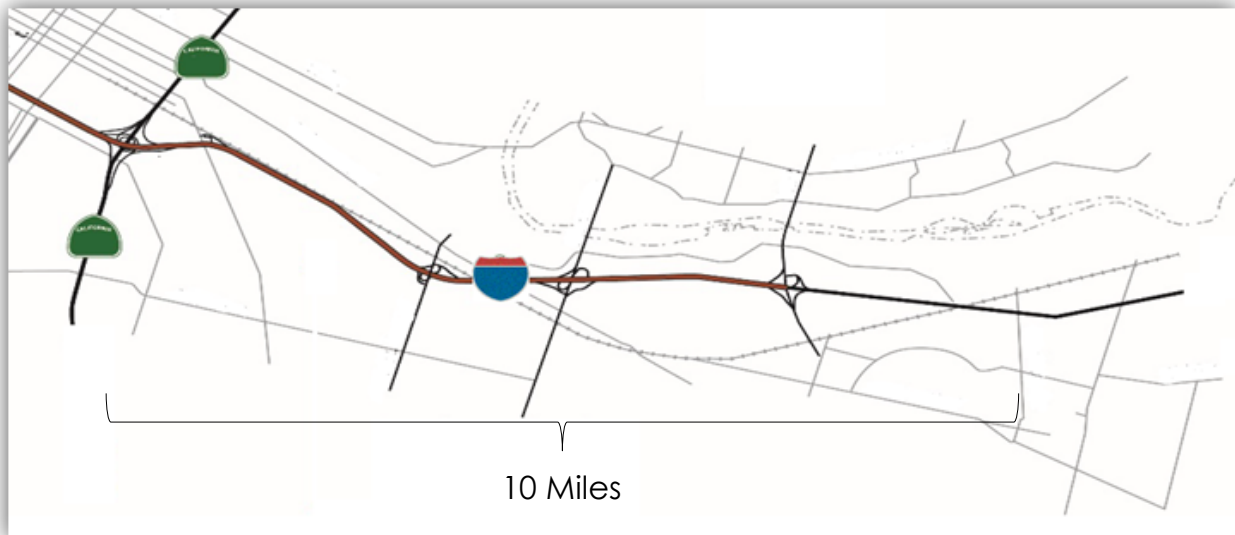
- Alternative 1 would construct 10 new miles of mixed-flow or general-purpose lanes on this facility in each direction from postmile (PM) 10.1 to 20.1.
- Alternative 2 would construct 10 new miles of HOV lanes on this facility in each direction from PM 10.1 to PM 20.1.
- Alternative 3 would construct 10 new miles of HOT lanes on this facility in each direction from PM 10.1 to PM 20.1.

Alternative 4 is the No-Build Alternative. The No-Build Alternative would not add any improvements to the existing facility.

The proposed project is funded by Measure Z. Sunshine County voters passed this ballot measure in the 2016 election. The project is listed in Measure Z and the 2018 Sunshine Metropolitan Transportation Plan (MTP). Among the alternatives,

Alternative 2 is the most consistent with Measure Z and is therefore the locally preferred alternative.

See Figure D-1 below depicting the study limits. Note that the project limits depict the physical extent of construction work, traffic study limits will extend beyond this area.



**Figure D-1. Example Project Map**

### **THE ANALYSIS:**

This section will go through the steps required to determine if an induced travel analysis is required for the proposed project, and if so, the steps needed to carry out the analysis. Each step identifies the relevant section(s) in the *Traffic Analysis Framework (TAF)* or *Transportation Analysis under CEQA (TAC)* where more detailed guidance can be found.

### **Project Scoping (TAC Section 4)**

The PEAR that was prepared for this project indicated that the project would likely require an EIR under CEQA because 1) the project would increase capacity on the SHs and the project type is listed in the Governor's Office of Planning and Research's *Technical Advisory on Evaluating Transportation Impacts in CEQA* as a project type that "would likely lead to a measurable and substantial increase in vehicle travel" and 2), due to anticipated impacts to biological resources. The NCST Induced Travel Calculator was used to provide a benchmark assessment of induced travel and for estimating necessary mitigation in later phases of the

project. The PEAR also considered tolled lane alternatives in order to potentially reduce the additional VMT resulting from the project. The PEAR recommended that an express (HOT) lane be evaluated at PA&ED.

### **Project Screening (TAC Section 5.1.1)**

As noted in the PEAR, the project is capacity increasing and will require an induced travel analysis.

### **Project Tiering (TAC Section 5.1.2)**

To determine if the proposed project could possibly tier off the travel analysis prepared for the MTP, the planner examined the MTP but found that it did not meet the requirements for tiering outlined in Section 5.1.2 of the TAC.

### **Selection of Traffic Analysis Methodology (TAF and TAC Table 1)**

Since the project is located on a Class I Interstate Facility in an urban area, the Selection Matrix for Preferred Induced Travel Assessment Methods for Projects on the SHS indicates that a quantitative analysis is required and that the NCST calculator should be applied, and that the Sunshine County Travel Demand Model (TDM) could be used if it meets checklist requirements for assessing induced travel and the model results are within 20 percent of the NCST calculator results. In this example, the Sunshine County TDM was chosen because the Sunshine County TDM is able to output link volumetric speed bin data, which will be useful for analysis of other impacts. The Sunshine County TDM was evaluated for its ability to model induced travel using the checklist in the TAF and it was determined that with a few modifications, the model could likely assess induced travel with reasonable accuracy so long as it was provided with likely land use changes. A Delphi panel of land use experts would determine the likely land use changes that would be attributable to the project in the horizon year. Existing conditions (2020) and the design/horizon year (2042) were assessed, applying the model with land use inputs from the panel of land use experts. For the General-Purpose Lane and HOV Lane Alternatives (Alternatives 1 and 2), the NCST calculator is applicable, and was used to estimate induced travel. The NCST calculator provides a long-run estimate of induced travel for the added lane miles. Modeling results are shown in Table D-1. For the HOT Lane Alternative (Alternative 3), the NCST Calculator is not applicable, and only the results from the TDM were included.

**Table D-117. Project Alternatives and VMT Evaluation**

<b>Project Alternative</b>	<b>County TDM Model Estimated Absolute Annual Million VMT<sup>18</sup></b>	<b>County TDM Model Estimated Project Induced Annual Million VMT</b>	<b>NCST Estimated Project Induced Annual Million VMT<sup>19,20,21</sup></b>
Existing Conditions 2020	5,000	N/A	N/A
No Build Alternative 2042	5,950	0	0
Add General Purpose Lanes 2042	6,080	130	132
Add HOV Lanes 2042	6,064	114	132
Add HOT Lanes 2042	6,072	122	N/A

The NCST is the benchmark Caltrans uses for induced travel analysis when it is applicable. Where travel model results are within 20 percent of the NCST calculator, they may be used in its place. In this case, the travel model results are within 20 percent of the NCST calculator, so the project team utilized these results for determining significance.

<sup>17</sup> The numbers in the table are based on a regional/county type assessment.

<sup>18</sup> Vehicle-miles of travel for the forecast year.

<sup>19</sup> Note that the NCST calculator uses a “baseline” year of 2016 for the metropolitan statistical area.

<sup>20</sup> For purposes of analysis the NCST calculator result in utilized for the horizon year. Note that the NCST calculator does not use a specific forecast year, but instead produces a “long-run estimate of induced VMT, the additional annual VMT that could be expected 5 to 10 years after facility installation.”

<sup>21</sup> Note that the NCST calculator does not distinguish between general purpose and HOV lanes, so the same numbers are used for both alternatives.



**Analyze Impacts and Determine CEQA Significance (TAC Sections 5.3 through 5.6)**

As shown by Table D-1, each of the build alternatives results in an increase in VMT over both the existing conditions and when compared to the future No-Build Alternative. The change in VMT from the future no-build alternative (i.e., the conditions expected to exist in the future absent the project) to the future build alternatives is the amount of VMT that is directly attributable to the project so that is the induced VMT. This is the impact that is the basis of the determination of significance.

The project is located in a metropolitan area and each alternative increases VMT over both existing conditions and compared to future conditions without the project. Therefore, according to the guidance in the TAC, each build alternative is found to have a significant effect on the environment and each alternative is found to conflict with CEQA Guidelines Section 15064.3(b).

It was also determined that the negligible and temporary increase in construction vehicles during construction of the project would be less than significant for each build alternative.

In the “Consistency with State, Regional, and Local Plans and Programs” section of the environmental document, each build alternative was also found to have a significant impact because the project was found to be inconsistent with state climate goals which call for a 15 percent reduction in total light-duty VMT by 2050 as compared to baseline 2050 levels.

Finally, each alternative was found to have a significant cumulative impact, because when combined with other past, current, and probable future projects in the region, the project would result in a significant increase in VMT.

**Mitigation (TAC Section 5.7)**

Mitigation was required for this project because the PDT determined that each of the build alternatives would result in a significant transportation impact under CEQA. Various mitigation options were considered for this project. Some were determined to be infeasible or ineffective and this determination was documented in the project file. For this example project, the PDT is proposing to add a 100-space Park and Ride lot near the southern end of the project limits. The addition of a Park and Ride lot is both feasible because is within Caltrans' jurisdiction and enforceable as Caltrans has direct control over on-system mitigation. According to a literature review conducted by Caltrans Division of Transportation Planning, Park and Ride lots have been estimated to reduce annual VMT by 2,700 to 7,200 per parking space, so Caltrans utilized the mid-point

of that range for an annual VMT reduction of 4,950 per parking space for a total of 495,000 VMT. This amount of VMT will be subtracted from the total amount of VMT generated by each build alternative in order to make a final CEQA conclusion for the project.

### **Final CEQA Conclusion**

Although the PDT was able to incorporate mitigation measures to reduce VMT, the impact will remain significant and unavoidable, because the remaining annual induced VMT is still significant. Because the mitigation was unable to reduce the impact to less than significant, a statement of overriding considerations will be considered. More guidance on the statement of overriding considerations can be found in Section 5.9 of the TAC.

## APPENDIX D-2. EXAMPLE PROJECT 2: CONSTRUCTION OF TRUCK CLIMBING LANES IN RAINBOW COUNTY

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**NOTE:** The purpose of this example project is to show the process for determining significance under CEQA for operational impacts resulting from induced vehicle demand. Discussions and analysis are intended to show the basic steps in the process and are not intended to reflect the complexity or detail that may be required for specific projects, including the need to analyze construction impacts and/or cumulative impacts.

### PROJECT DESCRIPTION:

In this example project, Caltrans is proposing to construct four miles of continuous truck climbing lanes in the westbound direction of a State highway in northern rural California that is part of the National Highway System and considered essential to Rainbow County's economy, defense, and mobility. The purpose of the project is to:

- Improve safety and operations by separating slower moving vehicles and trucks from faster moving passenger vehicles that are climbing the existing grade.

The proposed project has two alternatives:

- Alternative 1 would add four miles of continuous truck climbing lanes in the westbound direction from postmile (PM) 13.4 to 17.4.
- Alternative 2 is the No Build Alternative.

The proposed project is included in the 2018 Rainbow County Regional Transportation Plan. Rainbow County is not within the limits of an MPO or MSA.

### THE ANALYSIS:

This section will go through the steps required to determine if an induced travel analysis is required for the proposed project, and if so, the steps to complete the analysis. Each step will include the relevant section(s) in the *Traffic Analysis Framework (TAF)* or *Transportation Analysis under CEQA (TAC)* where more detailed guidance can be found.

### Project Scoping (TAC Section 4)

The PEAR that was prepared for this project indicated that the project would likely require an Initial Study (IS) and probable Negative Declaration (ND) under CEQA. Although the project type is listed in the OPR *Technical Advisory on Evaluating Transportation Impacts in CEQA* as the type of project that "would not likely lead to a measurable and substantial increase in vehicle travel" (e.g., addition of

passing lanes, truck climbing lanes, or truck brake-check lanes in rural areas that do not increase overall vehicle capacity along the corridor), it was also believed that four continuous miles of truck climbing lanes could potentially be viewed as a project that would “increase overall vehicle capacity along the corridor” and the determination was made to prepare an IS. Furthermore, an IS was recommended due to potential biological impacts resulting from the construction of the project.

### **Project Screening (TAC Section 5.1.1)**

The project type is identified as being unlikely to lead to a measurable and substantial increase in VMT, per the OPR Technical Advisory and Section 5.1.1 of the TAC. Specifically, Caltrans' TAF and OPR's Technical Advisory each indicate that the addition of passing lanes, truck climbing lanes, or truck brake-check lanes in rural areas that do not increase overall vehicle capacity along the corridor, are unlikely to lead to a measurable and substantial increase in VMT. However, because a fair argument might be made that a four-mile addition of truck climbing lanes may increase overall vehicle capacity, the PDT determined that a qualitative analysis was a reasonable approach during the PA&ED phase in order to support the conclusion that the project would not likely lead to a measurable and substantial increase in VMT, because overall capacity of the corridor is not increased and overall speeds will not change substantially.

### **Project Tiering (TAC Section 5.1.2)**

To determine if the proposed project could possibly tier off the travel analysis prepared for the RTP, the planner examined the RTP but found that it did not meet the requirements for tiering outlined in Section 5.1.2 of the TAC.

### **Selection of Traffic Analysis Methodology (TAF and TAC Table 1)**

Since the project is located outside an MSA on a State highway in rural northern California, the Induced Travel Assessment Method Selection Matrix for Projects on the SHS indicates that a qualitative analysis can be completed. To determine existing and projected conditions in the vicinity of the project, the RTP and the county's general plan were consulted. Traffic data in the RTP indicated that congested areas were limited to the one “town center within the county,” some 30 miles west of the project area. The general plan indicated that very little growth is expected in the county overall for the next 20 years, and that no land use changes are anticipated near the project that could increase overall congestion. Note that even in the absence of congestion, roads that simply provide greater access may facilitate development in locations that lead to induced travel. However, it was determined that demand for development in this location is considered unlikely and the truck climbing lanes would not provide greater access.

**Analyze Impacts and Determine CEQA Significance (TAC Sections 5.3 through 5.6)**

It was determined from the qualitative analysis that the transportation impacts of the project would be “no impact” and that the build alternative would not be in conflict with CEQA Guidelines Section 15064.3(b). In this instance, although four miles of truck climbing lanes could be viewed as a project that would “increase the overall vehicle capacity along the corridor,” the project would not induce travel (despite the added capacity) because there is no present or forecasted demand for the capacity and the project would not lead to substantially decreased travel times. Additionally, the demand for development in this location is considered unlikely and the truck climbing lanes would not provide greater access to land uses likely to induce additional travel.

It was also determined that the negligible and temporary increase in construction vehicles during construction of the project would be less than significant for the Build Alternative.

In the “Consistency with State, Regional, and Local Plans and Programs” of the environmental document, the build alternative was found to have “no impact” because the project would not result in induced travel.

Finally, because the build alternative was found to have “no impact,” it will not contribute to a cumulative impact.

**Mitigation (TAC Section 5.7)**

No mitigation is required because the PDT determined that the project would result in “no impact.”

## APPENDIX E. GLOSSARY OF ACRONYMS AND TERMS

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<b>AB</b>	Assembly Bill
<b>CAPCOA</b>	California Air Pollution Control Officers Association
<b>CARB</b>	California Air Resources Board
<b>CEQA</b>	California Environmental Quality Act
<b>CTF</b>	Cleaner Technologies and Fuels Scenario
<b>EIR</b>	Environmental Impact Report (state)
<b>FHWA</b>	Federal Highway Administration
<b>GHG</b>	Greenhouse gas
<b>HCM</b>	Highway Capacity Manual
<b>HOV</b>	High Occupancy Vehicle
<b>HOT</b>	High Occupancy Toll
<b>HSM</b>	Highway Safety Manual
<b>IS</b>	Initial Study (state)
<b>LD-IGR</b>	Local Development-Intergovernmental Review
<b>LOS</b>	Level of Service
<b>MND</b>	Mitigated Negative Declaration (state)
<b>MPO</b>	Metropolitan Planning Organization
<b>MTP</b>	Metropolitan Transportation Plan
<b>NCST</b>	National Center for Sustainable Transportation
<b>ND</b>	Negative Declaration (state)
<b>NEPA</b>	National Environmental Policy Act
<b>OPR</b>	Governor's Office of Planning and Research
<b>PDT</b>	Project Development Team
<b>PRC</b>	Public Resources Code (state)
<b>RTP</b>	Regional Transportation Plan
<b>RTPA</b>	Regional Transportation Planning Agency
<b>SB</b>	Senate Bill
<b>SCS</b>	Sustainable Communities Strategy
<b>SHS</b>	State Highway System
<b>TAF</b>	Caltrans Transportation Analysis Framework
<b>TISG</b>	Transportation Impact Study Guide
<b>VMT</b>	Vehicle Miles Traveled
<b>Capacity</b>	The Sixth Edition of the Highway Capacity Manual defines capacity as: The maximum sustainable hourly flow rate at which persons or vehicles reasonably can be expected to traverse a point or a uniform section of a lane or roadway during a given time period under prevailing roadway, environmental, traffic, and control conditions.

<b>Elasticity</b>	Elasticity is a measure of a variable's sensitivity to a change in another variable. In economics, elasticity is the measurement of the percentage change of one economic variable in response to a change in another. In transportation forecasting, an example is elasticity of travel demand, which can be expressed as the percent change in regional VMT divided by the percent change in regional lane-miles of state highways.
<b>Induced Travel (VMT)</b>	Induced travel (or the VMT attributable to a transportation capacity increase) is the increased amount of vehicle travel on the transportation network that is caused by travel behavior changes associated with decreased cost of travel due to improved travel times, improved reliability, or reduced price of travel. Over the short run, travel behavior changes including longer trips, more trips, mode shift, and route shift all tend to occur as a result of a highway capacity increase. Over the long run, these effects intensify (e.g. as people shift job or residential location to benefit from the infrastructure), and also land use development may become more dispersed, adding additional vehicle travel; for these reasons, long run induced travel is generally greater than short run induced travel.
<b>Network</b>	The connectivity of a transportation system. Changes in connectivity may change travel time and cost. Travel demand models will usually represent network connectivity within modes and across modes through a set of links connecting nodes.
<b>Travel Demand Model</b>	A travel demand model is any relatively complex computerized set of procedures for predicting future trip making as a function of land use, demographics, travel costs, the road system, and the transit system. These models often cover an entire metropolitan area or the entire State, but may also focus on a single city or county.
<b>Transit</b>	Transit generally includes all forms of shared common carrier passenger ground transportation in moderate to high capacity vehicles ranging from dial-a-ride vans to buses, trolleys, light rail, commuter rail, and intercity rail transportation.

<p><b>Trucks</b></p>	<p>Trucks are a subtype of the heavy vehicles category which includes trucks, intercity buses, and recreational vehicles. This Framework follows the Highway Capacity Manual definition of what constitutes a heavy vehicle: “A vehicle with more than four wheels touching the pavement during normal operation.” This is consistent with the Caltrans Traffic Census definition of a truck: “The two-axle (truck) class includes 1-1/2-ton trucks with dual rear tires and excludes pickups and vans with only four tires.”</p>
<p><b>Vehicle Miles Traveled (VMT)</b></p>	<p>The number of miles traveled by motor vehicles on roadways in a given area over a given time period. VMT may be subdivided for reporting and analysis purposes into single occupant passenger vehicles (SOVs), high occupancy vehicles (HOV's), buses, trains, light duty trucks, and heavy-duty trucks. For example, an air quality analysis may require daily VMT by vehicle class and average speed or vehicle operating mode (idle, acceleration, cruise, deceleration, etc.). For a CEQA compliant transportation impact analysis, automobile VMT (cars and light trucks) may be evaluated.</p>
<p><b>VMT Attributable to a Project.</b></p>	<p>In the context of a CEQA analysis, the VMT attributable to a transportation project, or induced travel, is the difference in passenger VMT between the with project and without project alternatives. VMT attributable to a project is equivalent to induced travel in this context.</p>



## APPENDIX F. ACKNOWLEDGEMENTS

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Made up of over 35 practitioners and stakeholders, the following participants met three times to provide detailed technical input for the development of the guidance documents:

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